

Claims

WHAT IS CLAIMED IS:

1. A method of transmitting data over a single-channel wireless network, the network including a plurality of nodes, the method comprising:

establishing a first link between first and second nodes selected from the plurality of nodes and transmitting data therebetween;

listening for a break in transmission between the first and second nodes;

waiting for a first predetermined time interval if a break in transmission between the first and second nodes occurs;

establishing a second predetermined time interval if the first predetermined time interval lapses with no detected transmission over the channel;

dividing the second predetermined time interval into a plurality of slots, wherein each node randomly selects one of the slots;

wherein one of the plurality of nodes establishes a second link if said one of the plurality of nodes has selected a slot earlier in time than slots selected by the remainder of the nodes.

2. The method of claim 1, further comprising reserving a slot for a first predetermined node.

3. The method of claim 2, wherein the slot reserved for the first predetermined node is the first slot in the second predetermined time interval.

4. The method of claim 2, wherein the slot reserved for the first predetermined node is a first reserved slot, and further comprising reserving a second reserved slot for a second predetermined node.

5. The method of claim 1, further comprising designating at least one of the nodes as priority nodes, and reserving a slot for each of the priority nodes.

6. The method of claim 1, wherein the first predetermined time interval is selected to be longer than any non-terminating break during transmission of the first link.

7. The method of claim 1, wherein one of the plurality of nodes is configured to attempt to establish a link another of the plurality of nodes through the listening, waiting, establishing and dividing steps for a third predetermined time, and wherein the one of the plurality of nodes cancels said attempt if unsuccessful in establishing the link at the end of the third predetermined time.

8. A method of avoiding the simultaneous transmission of data from a plurality of data sources over a single wireless channel, wherein each data source is operationally connected to a means for wireless communication over the network, comprising:

establishing a first wireless link between first and second data sources selected from the plurality of data sources and transmitting data therebetween;

listening, via the wireless communication means, for a break in transmission between the first and second data sources;

waiting for a first predetermined time interval if the break in transmission between the first and second data sources;

establishing a second predetermined time interval if the first predetermined time interval lapses with no detected transmission over the channel;

dividing the second predetermined time interval into a plurality of slots, wherein each data source randomly selects one of the slots;

wherein the wireless communication means operationally connected to one of the plurality of data sources establishes a second link if said one of the plurality of data sources has selected a slot earlier in time than slots selected by the remainder of the data sources.

9. The method of claim 8, wherein one of the plurality of data sources is configured to attempt to establish, via the wireless communication means operationally connected to it, a link another of the plurality of data sources through the listening, waiting, establishing and dividing steps for a third predetermined time, and wherein the one of the plurality of data sources cancels said attempt if unsuccessful in establishing the link at the end of the third predetermined time.

10. A single-channel, wireless network, comprising:

a plurality of nodes capable of receiving and transmitting data across the network, wherein a single link between two of the plurality of nodes can be established at any time, each link including a plurality of sequential data packets separated by non-terminating breaks in transmission, each node including

a listening structure that substantially continuously monitors communications on the channel and initiates a contention interval when no communication has been detected on the channel for a first predetermined time, wherein the contention interval is divided into a predetermined number of slots, and

a selection structure that randomly selects one of the predetermined number of slots,

wherein the node that has selected a slot that is earlier in time than slots selected by other nodes is permitted to establish a link.

11. The network of claim 10, wherein the first predetermined time is longer than any of the non-terminating breaks in transmission included in the link.

12. The network of claim 10, wherein the node that has selected a slot that is earlier in time than slots selected by other nodes establishes a link if said node has data to transmit to one of the other nodes.

13. The network of claim 10, further including a node priority feature that assigns a first one of the slots to a predetermined node.

14. The network of claim 13, wherein the first one of the slots is prior in time to the other of the slots.

15. The network of claim 13, wherein the predetermined node to which the first one of the slots is assigned is a first predetermined node, and wherein the node priority feature assigns a second one of the slots to a second predetermined node.

16. A method of transmitting data over a single-channel wireless network, the network including a plurality of nodes, the method comprising:

establishing a first link between first and second nodes selected from the plurality of nodes and transmitting data therebetween;

listening for a link termination message;

establishing a predetermined time interval upon detection of the link termination message;

dividing the predetermined time interval into a plurality of slots, wherein each node randomly selects one of the slots;

wherein one of the plurality of nodes establishes a second link if said one of the plurality of nodes has selected a slot earlier in time than slots selected by the remainder of the nodes.

17. The method of claim 16, further comprising reserving a slot for a first predetermined node.

18. The method of claim 17, wherein the slot reserved for the first predetermined node is the first slot in the predetermined time interval.

19. The method of claim 17, wherein the slot reserved for the first predetermined node is a first reserved slot, and further comprising reserving a second reserved slot for a second predetermined node.

20. The method of claim 16, further comprising designating at least one of the nodes as priority nodes, and reserving a slot for each of the priority nodes.